ment of neuromyopathy's resuscitation and must be initiated from the beginning of hospitalization in the ICU to prevent further complications.

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P063-e

An application of mechanostat theory to protect muscle-bone unit in spinal cord injury

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Keywords: Mechanostat theory; Bone-muscle unit; pQCT; SCI
Background.– Evidence shows that if muscle force is below a certain set point, i.e. if muscles are paralyzed, bone tissue is lost. The goal of this cross-sectional study was to investigate Frost's mechanostat theory in spinal cord injured subjects.
Methods.– The study included 31 complete paraplegics (AIS A, mean duration of paralysis: 5.6 ± 6 years) divided according to the neurological level of injury compared with 50 controls. All were examined with peripheral quantitative computed tomography (pQCT XCT-3000, Stratec Medizintechnik, Germany) in the tibia. Images were taken at 66% of the tibia's length (bone area/muscle area ratio).
Results.– In controls muscle area was highly correlated with bone area obtained from p QCT. In paraplegics statistically significant higher ratios bone area per unit of muscle area vs. controls were found ($P < 0.001$).
Discussion.– The relationship between bone and muscle was consistent in able-bodied and predictably altered in those with spinal cord injury, a clinical disease affecting bone and muscle. The result could be partial explained by the bone steady state while muscle was already in steady state and suggests that we can interfere to the bone area/muscle area ratio many years after paralysis to protect bone and muscle in SCI subjects.

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P064-e

Stance and gait changes after medial head of gastrocnemius (MHG) bisection in patients suffering from popliteal artery entrapment syndrome (PAES)

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Background.– This pilot study has been organized to research the effects of MHGM bisection on the gait cycle of patients suffering from PAES. This syndrome is a cause of intermittent claudication and may lead to degenerative stenosis of the artery and ischemia. Encountering that gastrocnemius is a muscle that plays several roles from the mid stance to the heel off faces of the gait cycle it is important to research whether this therapy creates an unstable and uncomfortable gait. No bibliography exists so far regarding this correlation.
Methods.– Patients complaining for intermittent vascular claudication will be investigated with: Magnetic resonance imaging of the popliteal fossa to ensure the entrapment of the artery and examine the size of the gastrocnemius; Digital angiography to confirm the entrapment; Kinetic gait analysis to estimate the ground forces throughout the gait cycle, the centre of gravity for the body and the perception of balance. The imaging examinations will be performed before and 3 and 6 months after the surgery.

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P065-e

First results of kinematics analysis protocol on segmental shoulder motion with optoelectronic system for movement analysis in patients with rotator cuff syndrome

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Keywords: Kinematic analysis; Optoelectronic system; Movement analysis; Rotator cuff Syndrome; Segmentary shoulder's movements
Background.– In our kinematic analysis laboratory we have developed a protocol for angles measurement of the humerus and the scapula rotation during the segmentary shoulder's movements, with an optoelectronic system.
Methods.– This protocol has been validated on 30 healthy subjects and tested on 25 patients with rotator cuff syndrome documented by shoulder's clinical tests or echography. The aim of this work is to determine for which movement there are the most relevant restrictions on examined patients. For the movement analysis we have used an optoelectronic digital system (BTS SMART-DX) consists of two of infrared cameras directly connected to an integration box that contains appropriate software for data capture and motion analysis. The protocol used 8 markers positioned on anatomical points of subject's shoulder.
Results.– It has been possible to analyse the shoulder's movement limitations caused by rotator cuff syndrome. The most sensitive movements, compared to the normal class ones, are and humerus abduction ($95.83^\circ \pm 20.04$) and flexion ($133.27^\circ \pm 12.56$), extra-rotation ($58.77^\circ \pm 19.33$) and intra-rotation ($69.47^{\circ\circ} \pm 17.98$) while the less sensitive movements are scapula rotation during abduction and flexion ($42.73^\circ \pm 1\%$ and $48.63^\circ \pm 11\%$).
Discussion.– Next step is to use this protocol to follow how this angles change during the time in these patients after different medical or physical therapy.

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P066-e

Clinical value of musculoskeletal ultrasound in monitoring a novice treatment for acute plantar fasciitis: A note about capacitive resistive diathermy. Case report

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Keywords: Musculoskeletal ultrasound; Plantar fasciitis; Capacitive resistive diathermy; Monitoring treatment
Background.– Plantar fasciitis is the most common cause of heel pain afflicting nearly anyone stands for long time, the pain associated has a dramatic impact on physical mobility. Applying treatment with hope to speed up recovery after acute injury of plantar fascia is not yet justified by sufficient scientific data; the capacitive resistive diathermy (CRD) (Human Tecar®, Calco, Italy) has been suggested for early recovery of musculotendinous injuries while musculoskeletal ultrasound (MSUS) proved to be an excellent tool in diagnosing plantar fasciitis. Herein, we present a case of acute plantar fasciitis treated with 2 sessions of CRD, using MSUS for monitoring its efficacy.
Results.– A 52-years-old male with acute plantar fasciitis – diagnosed clinically and sonographically – was treated by CRD (Human Tecar®) followed by plantar

stretching in two sessions 4 days apart. Visual analogue scale (VAS) of pain, heel tenderness index (HTI), and MSUS were performed at baseline, after 1st and 2nd session. Improvement was assessed clinically and by MSUS that showed rapid reabsorption of localized and diffuse oedema immediately after sessions.
Discussion.– Our observations denote the ability of ultrasound to detect rapid effect of CRD in improving acute plantar fasciitis at structural level; this suggests that ultrasound can be used as an objective measure of therapeutic response [1].
Reference
[1] Sabir, et al. Clinical utility of sonography in diagnosing plantar fasciitis. J Ultrasound Med 2005;24:1041–8.

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P067-e

Biomechanics analysis of the ilio-psoas transfer related to the lumbosacral myelomeningocele

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Keywords: Ilio-psoas transfer; Myelomeningocele; Musculoskeletal model
Background.– Ilio-psoas (IP) transfer related to the lumbosacral myelomeningocele (LMMC) is realized during the first 4 years after birth in order to stabilize the hip and avoid joint subluxation [1]. The aim of this study was to demonstrate the extension capacity of IP after transfer during level gait.
Methods.– A clinical gait analysis (CGA) was performed on one patient (35-years-old). Kinematics, kinetics and EMG data (including IP activity) were recorded during level walking. IP fiber length and lever arm around the flexion-extension axis of the hip were estimated using a lower limb musculoskeletal model (MSM).
Results.– First, the hip kinematics and kinetics are almost normal during the gait cycle. Second, EMG records show that IP activity pattern is similar to the asymptomatic gluteus maximus pattern and that hip flexion is performed by secondary hip flexors (adductors and rectus femoris). Third, estimated IP fiber length and lever arm patterns vary in the same way as for an asymptomatic hip extensor.
Discussion.– CGA and MSM results show that IP transfer related to LMMC allows to restore an efficient proximal propulsion and to avoid hip joint subluxation.
Reference
[1] Sharrard WJW. J Bone Joint Surg Br 1964:46.

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P068-e

Medical rehabilitation in a syringomyelia case

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Methods.– We present the case of a 68-years-old patient with cervico-dorsal syringomyelia, bilateral neuropathic scapulohumeral arthropathy and mixed dyslipidemia hospitalized in the Medical Rehabilitation Clinical Hospital Baile Felix, Romania.
Results.– At admission she was complaining of paresthesias and motor upper limb weakness, rachialgia, difficulty in walking, thermal anesthesia, with no history of trauma. She had in 2012 decompression of craniospinal junction by median suboccipital craniectomy with foramen magnum opening and posterior C1 laminectomy, resection of right cerebellar tonsil and dura plasty. Neurological examination revealed brachial diplegia: upper limbs hypotrophy and distal amyotrophy with simian hand, abolished osteotendinous reflexes through peripheral motor neuron syndrome, spastic paraparesis of the lower limbs, exaggerated osteotendinous reflexes through pyramidal syndrome, paravertebral amyotrophy, loss of thermoalgesic sensitivity. Scapulohumeral X-ray revealed humeral heads lysis. We assessed the degree of functional independence using FIM scale, obtained score was 95 from 126. The most affected were mobility and locomotion. Functional reeducation goals: pain amelioration, ameliorating movement disorders with regaining postural control, gait reeducation, establishment of movement patterns for upper limbs, regaining functional independence and reeducation of thermoalgesic sensitivity. These were achieved by hydrokinetotherapy, occupational therapy, physiotherapy, massage.
Discussion.– The major principles underlying medical rehabilitation are represented by functional reeducation.

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